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UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, SECRETARY

BUREAU OF MINES
A. C. FIELDNER, ACTING DIRECTOR

# INFORMATION CIRCULAR

## MINE SAFETY BOARD DECISION 32

(SUPERSEDING MINE SAFETY BOARD DECISION 5)

## PREVENTION OF COAL-DUST EXPLOSIONS BY ROCK DUSTING

BY

MINE SAFETY BOARD

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UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

# MINE SAFETY BOARD DECISION 32[1/] [2/]

(Superseding Mine Safety Board Decision 5)

## Prevention of Coal-Dust Explosions by Rock Dusting

To prevent the propagation of mine explosions, the Bureau of Mines recommends:

1. That all coal and lignite mines, except anthracite mines shall be rock dusted.

2. That rock dust shall be distributed upon top, bottom, and sides of all underground openings of every description, to within at least 40 feet of all working faces and the areas not rock dusted shall be kept wet.

3. That the rock dust shall be maintained in such quantity that the incombustible material in representative samples of dust collected shall not be less than 65 percent. Where methane gas is present in the ventilating current, the minimum percentage of incombustible matter in the mine dust shall be increased 1 percent for each 0.1 percent of methane.

4. That when the rock dust in any area becomes caked so that it cannot be dispersed readily as a cloud in the air, that part of the mine shall be redusted immediately.

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1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 7109."

2/ To reduce differences of opinion and to obtain a generally acceptable decision on any question, the Director of the Bureau of Mines established a Mine Safety Board by order dated May 20, 1924 (effective June 1, 1924) - "*** to consider questions arising within any divisions of the Bureau that require a definition of the Bureau's collective opinion as to safety practices, safety devices, or safety methods for underground operations or open-pit mining. ... The approved decisions shall form the basis of teaching and policy for the Bureau.



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5. That the dust to be used shall not contain more than 5 percent of combustible matter nor more than 25 percent of quartz or free silica; all of the dust shall pass through a sieve having 20 meshes per linear inch and 60 percent or more shall pass through a sieve having 200 meshes per linear inch; the dust shall not absorb moisture from the air to such an extent as to cake and destroy its effectiveness as a dry dust.

6. That rock-dust barriers shall not be regarded as a substitute for generalized rock dusting.

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Research and experience have shown that maintenance of an adequate percentage of rock dust in all underground openings, whether gassy or not, of bituminous and subbituminous coal and lignite mines (anthracite dust does not propagate explosions) is the best means of preventing coal dust explosions. In rare instances where all fine coal particles on the floor, ribs, roof, and timbers are in a muddy condition continuously rock dusting is unnecessary.

The term "underground openings" refers to all unsealed openings whether they contain track or not, and includes rooms, entries, crosscuts, breakthroughs, rock tunnels, slopes, haulageways, airways, and travelingways. The sealing of unused or abandoned parts of a mine in accordance with Mine Safety Board Decision 6[3] avoids the necessity of rock-dusting the sealed-off openings.

The kind of rock dust to be used should have the approval of the State Mine Inspection Service. Pure limestone or pure dolomite produces the best rock dust, as these dusts have low silica content, little tendency to cake, and a light color that aids illumination. To reduce tendency to cake it is preferable that not more than 75 percent of the dust pass the 200-mesh sieve. All sieve sizes are those of the Tyler screen scale. If the mine personnel is repeatedly exposed to breathing high concentrations of the dust, the percentage of free and combined silica should be as low as possible, preferably less than 5 percent. Persons engaged in the application of rock dust should wear approved dust respirators as listed in Bureau of Mines Information Circular 7030 or revisions thereof.

After a mine or any part of a mine has been rock dusted, samples of dust for analysis should be taken from the floor, rib, roof, and timbers at such intervals of time as will give ample warning of the need for redusting in order to maintain the required minimum percentage of incombustible in the mine dust. Details of the methods of sampling and analysis are given in Bureau of Mines Information Circular ~~7109~~ 7113.

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3/ Recommendations of the United States Bureau of Mines on Certain Questions of Safety as of October 1, 1936: Bureau of Mines Inf. Circ. 6946, 1937, pp. 12-13.



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To minimize the dilution of rock dust by freshly formed coal dust, machine cuttings or bug dust should be thoroughly wetted by using water on the machine cutter bars or otherwise, and all working places should be kept wet for a distance of about 40 feet from the face.

Rock-dust barriers of the types recommended in Bureau of Mines Bulletin 353, or supplements thereto, when approved by the State Mine Inspection Service may be erected for the purpose of preventing flame from passing into or out of unsealed worked-out areas which are inaccessible for rock-dusting. They shall be so placed as to prevent passage of flame along all openings into the area in question, and each barrier shall be loaded with at least 60 pounds of approved rock dust for each square foot of cross-section at its location. All barriers should be thoroughly inspected at least once a month and kept in good operating condition. The dust in all barriers should be kept in such condition that it will fall loosely into the air when the barrier is operated. The location of barriers should be shown on the working mine map. However, because they do not receive in practice the close attention necessary to maintain them in satisfactory operating condition, the use of barriers is not recommended except to supplement generalized rock-dusting under special conditions.

RECOMMENDED, February 5, 1940.
MINE SAFETY BOARD.

D. Harrington, Acting Chairman.

A. C. Fieldner

C. F. Jackson

Wilbert J. Huff

L. C. Ilsley

J. J. Forbes

H. H. Schrenk

APPROVED, February 20, 1940.
A. C. FIELDNER,
Acting Director.



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